
Space Weather Forecast

Issued on Friday, 23 February 2024 at 13:04 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: High solar activity. Current strongest flare of the solar cycle recorded with a chance of further strong flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been High over the past 24 hours, with a strong flare recorded at 22/2234 UTC, currently the strongest flare of the solar cycle, from the large region in the northeast. This continues to be by far the largest and most complex of the seven sunspot regions on the visible disc, despite some apparent reduction in complexity in the past 12 hours or so. The remaining regions are much smaller and appear simpler, however, the three regions close to the eastern limb may reveal more complexity as they rotate into clear view on the disc.

A minor Coronal Mass Ejection (CME) was observed leaving the sun in solar imagery following the X6.3 flare, however this appears to be directed to the east of the Earth-Sun line, with any Earth-directed component considered unlikely.

Solar Wind / Geomagnetic Activity: Solar winds have been at ambient levels throughout. Total magnetic field strength has been weak, with the important north-south component initially weakly negative, but becoming mainly weakly positive from around 22/1700UTC. Geomagnetic activity was Quiet (Kp0-1).

Energetic Particles / Solar Radiation: Solar radiation was slightly above normal background levels, but well below the Minor Radiation Storm threshold.

Four-Day Space Weather Forecast Summary

Solar Activity: Activity is forecast to remain Moderate to High, with occasional Moderate flares expected and a chance of further isolated Strong flares, particularly in the near term, from the large region in the northeast.

Solar Wind / Geomagnetic Activity: A large filament (loop of plasma) was observed leaving the northwest of the disc around 21/1730UTC and is modelled to perhaps give a glancing blow late on day 2 (24 Feb) or more likely early on day 3 (25 Feb). No other CMEs currently feature in the forecast. Current solar winds are near background values but faster solar winds are expected to connect with Earth perhaps as early as day 2 (24 Feb) but more likely by day 3 (25 Feb), and persist through the remainder of the period. Peak speeds expected around 500km/s. Geomagnetic activity is forecast to remain Quiet initially. Unsettled to Active intervals are then considered likely on days 2 and 3 (24/25 Feb), with a chance of G1/Minor storm intervals, particularly if connection to the faster winds and the glancing blow from the filament CME occur at similar times.

Energetic Particles / Solar Radiation: Solar radiation levels are expected to continue at generally background levels or just above, but the large region in the northeast will become an increasing source of potential solar radiation as the region moves towards and beyond centre disc through the forecast period, with a slight but increasing chance of S1 Minor Radiation Storms.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	1	10	30	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	Yes	80	80	75	70
Very Active	R3 to R5 X	Yes	40	40	30	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	10	15	20	25
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)